Office of Student Financial Assistance

SFA Modernization Partner

FAFSA on the Web
Semi-Monthly Status Report

Task Order #42

Deliverable 42.3.1a

September 15, 2001

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1.0 Executive Summary

The U.S. Department of Education's Office of Student Financial Assistance Programs (SFA) administers and operates the "Free Application for Federal Student Aid" (FAFSA). While available in paper form, SFA also provides this service through a web site. U.S. college students seeking student financial aid use the FAFSA program. During the academic year 2001-2002, over two million students used the web site to apply for federal financial aid. SFA anticipates that the number of users / applicants will double during the 2002-2003 academic year, and will continue to rise in future years as the number of paper submissions decreases. This anticipated growth makes it imperative that SFA maximize the capacity and availability of the FAFSA web infrastructure while at the same time minimizing the amount of support SFA's representatives will have to provide for questions by students or difficulties with completing the form. The web FAFSA product is commonly referred to as FAFSA on the Web and incorporates all requirements related to the paper FAFSA for each school year.

The FAFSA on the Web 6.0 project is on schedule with many planned activities completed. The detailed project work plan, CRAD, Functional Specification, High-Level Design, and Detailed Design Documents (DDD's) have been documented and delivered. Development and unit testing is on schedule. The team has updated plans, design documentation, and architecture diagrams to reflect the migration from SUN to HP while continuing with capacity planning. The stress/performance test environment will be available on 9/24. The Modernization Partner team is also working with the VDC team to determine how much storage is required for the Oracle databases in the production environment.

All known issues and risks have been identified, and are being monitored closely. Specific action required for resolution is being taken. The Modernization Partner anticipates successfully meeting the following guiding principles:

1. Production Delivery by 01/01/02 to support the 2002 – 2003 school year.
2. New look and feel for easier usability and enhanced accessibility of the application.
3. N-Tiered Integrated Technical Architecture (ITA) that conforms to SFA's infrastructure standard and forms the foundation for effective upgrades and enhancements. These SFA standards include WebSphere, IHS, and Oracle.
4. Improved performance and scalability to meet customer demands and technical capacity.
5. Maximum re-use from the Release 5.x design, code, and documentation to meet the goals of the FAFSA on the Web initiative.

2.0 Introduction

Overview

The U.S. Department of Education's Office of Student Financial Assistance Programs (SFA) administers and operates the "Free Application for Federal Student Aid" (FAFSA). While available in paper form, SFA also provides this service through a web site. U.S. college students seeking student financial aid use the FAFSA program. During the academic year 2000-2001, over two million students used the web site to apply for federal financial aid. SFA anticipates that the number of users / applicants will double during the 2001-2002 academic year, and will continue to rise in future years as the number of paper submissions decreases. This anticipated growth makes it imperative that SFA maximize the capacity and availability of the FAFSA web infrastructure while at the same time minimizing the amount of support SFA's representatives will have to provide for questions by students or difficulties with completing the form. The web FAFSA product is commonly referred to as FAFSA on the Web and incorporates all requirements related to the paper FAFSA for each school year.

The primary objectives for redesigning FAFSA on the Web are to leverage industry best practices to improve usability and accessibility by customers, performance of the web application during peak periods of FAFSA submissions, and create the foundation for efficient enhancements, as necessary. The areas of focus will be:

- Usability & Accessibility
- Technical Capacity (technical infrastructure and application performance)
- Leveraging industry best practices around human interaction models for Web-based solutions

Background

The FAFSA on the Web application is released on a school year basis. The current application available on the web is FAFSA on the Web Release 5.0 for the 2001 – 2002 school year. This application is available on the web site with the following URL – http://www.fafsa.ed.gov.

As part of the FAFSA on the Web Release 5.x initiative, SFA examined various design, usability, technical, and performance factors in consideration of FAFSA on the Web Release 6.0, which is scheduled to be available to the public on January 1, 2002. This initiative leveraged the SFA experience with prior versions of the application and provided design, usability, technical, and performance input for the development and deployment of Release 6.0 of the application. Efforts associated with the release 5.x initiative were performed using SFA's standard Information Technology Architecture (ITA) based on the Sun platform for WebSphere and IHS. Efforts associated with the release 6.0 initiative will be performed in an HP environment at the VDC. Marketing

and communication alternatives were also included in the Release 5.x initiative to aid in the increased use of the web product.

A transition team established by SFA included team members from the release 5.0 and 5.x team to establish the approach, milestones, project plans, organization, roles, responsibilities, and the level of effort associated with the development of FAFSA on the Web Release 6.0. The approach for Release 6.0 leverages technology such as the n-tier SFA architecture at the VDC, new look and feel, performance and scalability from the release 5.x while incorporating the business logic, edits, and other key processes from the current release 5.0 production application. Performance and stress tests conducted on the release 5.X application developed in the VDC using the Sun architecture are also being leveraged to validate the scalability and performance of the application in its release 6.0. The guiding principles, key assessments, and validation as well as the project plan for release 6.0 have been developed as part of the FAFSA on the Web Release 6.0 Transition.

This semi-monthly report provides the following:

- Section 3. Accomplishments. Provides an overview of all completed activities including updated documentation, issues resolved, key decisions made, and application components developed will be described.
- Section 4. Planned Activities. Provides an outline of all remaining planned activities including development, testing, documentation, and production deployment.
- Section 5. Open Issues, Risks, and Mitigation Strategies. Provides a listing of all open issues, risks, and status including solution alternatives and recommendations.
- Section 6. Summary. Provides an overall status summary of the project.
- Appendix A. Application Development Detailed Project Schedule. Provides a complete listing of all application development activities, schedule, and resource assignments. The detailed work plan is organized with the following phases:
    - Phase 1a / b (Preliminary / Detailed Planning). This includes tasks associated with documenting the Customer Requirements Allocation Document (CRAD), Functional Specification, and High-Level Design (HLD).
    - Phase 2 (Development). This includes preparing the Detailed Design Documents (DDD's) and performing all application code development and unit, functional, system, usability, performance, and usability testing.
    - Phase 3 (Validation). This includes ED acceptance testing, beta testing, regression testing, and the Production Readiness Review (PRR).

- Appendix B. Technical Architecture Detailed Project Schedule. Provides the technical architecture detailed project schedule. This includes the following activities:
  - Architecture Design
  - Environment Build-out
  - Beta Testing Support
  - ITA Support
  - Application and Architecture Configuration Updates
  - Update VDC Operations Documentation
  - Performance Testing

- Appendix C. Physical Architecture Diagram. Provides the updated physical architecture diagram to reflect the change from SUN to HP.
- Appendix D. Application Architecture Diagram. Provides the updated application architecture diagram to reflect the change from SUN to HP.
- Appendix E. Performance Test Plan. Provides the current Performance test plan that includes capacity planning information.

3.0 Accomplishments

Completed Activities

Based on the application development and technical architecture schedules provided in Appendixes A and B, the following major activities have been completed:

- Customer Requirements Allocation Document (CRAD). This document provides a complete listing of all new requirements and enhancements to be made for Release 6.0. This document also includes reference to all other requirements and design documentation so that the new requirements can be traced throughout all documentation.
- Functional Specification. This document provide an overview of the entire application; details requirements for external interfaces, functions, performance, and design constraints; and outlines accessibility guidelines.
- High-Level Design. This document provides an overview of each module's functionality and design as well as hardware, external software, system, user, database, and communication interfaces.
- Detailed Design Documents (DDD's). These documents provide the detailed design for all requirements of the application.
- Capability Maturity Model (CMM) Training. The Modernization Partner team provided CMM training on 7/20 to the SFA CIO team and their primary contractor, SOZA, to provide them with an overview of the quality processes and documentation to be used during this project. A follow-up meeting was held on 8/23 with SFA and SOZA to define their deliverable schedule.
- System Walk-Through. Held on 7/26, the Modernization Partner team provided SFA with a walk through of the system requirements and changes from the production system.
- Office of Management and Budget (OMB) Walk-Through. SFA and the Modernization Partner provided a walk-through of the new system requirements and web pages to a representative from OMB on 8/29.
- Physical and Application Architecture Diagrams. The updated physical and application architecture diagrams can be found in Appendixes C and D.
- Development and Test Environments. The local development server, VDC development server, and VDC test server environments have been configured.
- Responded to CIO Quality Assurance (QA) Memorandum of Records (MOR's). The Modernization Partner team has responded to the first set of Requirements MOR's that were provided by the CIO QA team.
- Application Development and Unit Test. The following core functionality has been developed and unit tested:
- Corrections

- SaveRestore
- PrintSubmit
- Renewals
- Fill-Out FOTW
- Spanish FOTW
- School Code (embedded)
- School Code (standalone)
- JavaScripts
- Drug Worksheet (WS)/Standalone
- WSA, WSB, WSC, Income, Household, and Pre-Application Worksheets
- E-Signature
- Student Access
- Application Status Check
- Expected Family Contribution (EFC)
- End Of Edit (EOE)
- Web Demo
- Integration with Chat System
- FAFSA API
- Index Pages
- Template/Include/Tag Libraries
- Common Libraries

- Code Migration to VDC HP environment. The Modernization Partner team has successfully migrated application code from the local SUN development server to the VDC HP development server.

Key Decisions Made, Issues Resolved, and Risks Mitigated

The following are the major decisions that have been made or the key issues that have been resolved since the beginning of this project:

- Integrated 6.0 Application Architecture Design Approach. The Modernization Partner transition team defined the integrated 6.0 design approach to leverage technology such as the n-tier SFA architecture at the VDC, new look and feel, and performance and scalability from the release 5.x application code while incorporating the business logic, edits, and other key processes from the release 5.0 production application.

- 5.x Usability Test Recommendations. SFA and the Modernization Partner team reviewed the 5.x usability test results to prioritize recommendations for the 6.0 release as well as future enhancements.

- Corrections Design Approach. SFA and the Modernization Partner team reviewed the 5.0 and 5.x sites to determine the best design approach for Corrections. The 6.0 site will provide students with a complete list of questions to select for correcting (following the 5.0 shopping cart approach) and then

show one question at a time (following the 5.x design) for them to make the corrections.

- Student Access Design Approach. SFA and the Modernization Partner team reviewed several design alternatives before deciding on including the 5.0 Student Access pages within the 5.x navigation layout (i.e., new look and feel).
- Page Navigation Design Approach. SFA and the Modernization Partner team decided not to include the page numbers on the upper right side of the page to avoid student confusion while navigating through the steps.
- Date Fields Format. SFA and the Modernization Partner team decided to have the date field be entered without slashes (e.g., 12051971) to be consistent with the PIN site and CPS databases.
- Lists Design Approach. SFA and the Modernization Partner team decided to utilize drop-down lists instead of radio buttons for lists where the student can choose only one option.
- Error Flagging Design Approach. SFA and the Modernization Partner team decided to display only red arrows next to fields where the student did not enter data correctly.
- HP Migration. When the 6.0 project began, all development and testing efforts were planned for the standard ITA based on the SUN platform. Due to potential cost avoidances with switching platforms to HP, the Modernization Partner team worked with the VDC team to revise plans and mitigate schedule and costs issues with migrating the application to HP.
- DASD for Performance Test environment. SFA and the Modernization Partner team worked with the VDC team to determine that there were no additional DASD requirements for the 6.0 performance test environment.

4.0 Planned Activities

Based on the application development and technical architecture schedules provided in Appendixes A and B, the following major activities are planned:

- Capacity and Performance Test Planning. The Modernization Partner team is continuing to work with the VDC team on preparing a detailed capacity analysis and performance test plan. The teams will also conduct performance testing from 9/24 - 11/30. The current version of the performance test plan that also includes capacity planning information can be found in Appendix E.
- Functional Testing. Functional testing will be performed from 9/18 – 9/28. FAFSA Customer Service Representatives (CSR's) will be leveraged to ensure that the site is functioning correctly.
- System Testing. System testing will be performed from 10/2 - 11/16 to validate that all requirements have been met and that the application is functioning correctly.
- Usability Testing. Usability testing will be conducted from 9/24 - 9/28. The goal of the usability test is to objectively measure and quantify the usability of the redesigned FAFSA, to identify areas for improvement, and to make usability recommendations.
- ED Acceptance Testing. SFA is leading acceptance testing with support from the Modernization Partner team.
- ED Accessibility Testing. SFA will coordinate accessibility testing with the appropriate Department of Education CIO team.
- Beta Testing. SFA and the Modernization Partner team will plan for and conduct beta testing from 12/3 – 12/17.
- Production Readiness Review (PRR). The PRR will be held in December. All VDC-required documentation will be finalized by that time for SFA review and approval.

5.0 Open Issues, Risks, and Mitigation Strategies

The following issues have been identified and are currently being resolved:

- Branding Changes. The SFA Chief Operating Office (COO) has requested specific branding-related changes be made to the web site home page. Recommended changes are grouped accordingly:
- Revised Logo to emphases FSA
- Bottom Navigation Bar
- Text Change to Federal Student Aid
- Database Storage for Production. The following three new Oracle databases require additional storage for production:
- Temporary Save. This is where the application puts a record if user clicks the "save" button.
- Session Management. This is where WAS will be putting active session data. This is for the clustering.
- WAS Administration. This is the WAS configuration DB.
- ISP for Production. Additional network and ISP capacity is required to handle peak production capacity. SFA and the Modernization Partner team will work with the VDC team to coordinate the procurement of what is required.
- Production/Operations Roles and Responsibilities. The Modernization Partner team is working with the VDC team to define the roles and responsibilities for the Production environment.
- CIO Quality Assurance (QA) Role, Deliverables, and Schedule. SFA and the Modernization Partner team are working with the CIO QA team to define an appropriate role, deliverables, and schedule that will add the most value to the FAFSA product.

The following risks and mitigation strategies have been identified:

- Performance. For capacity planning purposes, peak volume is anticipated to more than double for the 2002-2003 cycle, and could approach between four and five million students. To help mitigate potential performance issues, the Modernization Partner team defined the following design/performance areas as having a high priority for application development:
- IBM HTTP Server (HIS) and WebSphere Application Server (WAS) on separate hardware servers
- Database Connection Pooling
- Session Size (<3k)
- Oracle Temporary Save
- JavaServer Pages (JSP's)

Four performance test cycles are planed with the following three objectives:

- Validate the n-tier architecture for FAFSA 6.0
- Verify that the application will scale
- Verify the performance capability of the FAFSA 6.0 relative to users

6.0 Summary

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